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EXAMINER	
ALEJANDRO MULERO, LUZ L	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,590	FINK, STEVEN T.	
	Examiner	Art Unit	
	Luz L. Alejandro	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *14-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of group I, claims 1-13, in the reply filed on 7/7/05 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the examiner if all the claims were examined together. This is not found persuasive because different searches and/or different examination/considerations are required for the claims of the instant application.

The requirement is still deemed proper and is therefore made FINAL.

Claims 14-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because: the year indicated in the date of signature is improper (note that the year should have been 2003 or 03 instead of just 3).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Benzing et al., US 5,405,480.

Benzing et al. disclose a plasma source assembly comprising: an outer shield comprising a plurality of plates; a dielectric chamber wall 20; a helical coil 18 provided between the outer shield and the dielectric chamber wall; and a coil support means 12/14 (see, for example, figs. 1-2 and their descriptions).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benzing et al., US 5,405,480.

Benzing et al. is applied as above. Additionally, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishimaru, US 5,681,418.

Ishimaru disclose a plasma source assembly comprising: an outer shield comprising a plurality of plates; a dielectric chamber wall 2; a helical coil 40 provided between the outer shield and the dielectric chamber wall; a coil support and securing means 41; wherein the dielectric chamber wall and the outer shield define a resonator cavity, and wherein the coil is provided in the resonator cavity; and means for circulating cooling fluid throughout the resonator cavity (see, for example, fig. 1 and its description, and col. 5, lines 13-16).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishimaru, US 5,681,418.

Ishimaru is applied as above. Additionally, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Claim 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishimaru, US 5,681,418, as applied to claims 1-2 and 4-5 above, and further in view of Hull, US 4,431,901.

Ishimaru is applied as above but does not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull

discloses an inductive plasma apparatus comprising plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Ishimaru as to further comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishimaru, US 5,681,418 in view of Hull, US 4,431,901, as applied to claims 6 above, and further in view of Komino, US 5,584,971.

Ishimaru and Hull are applied as above but do not expressly disclose means for removing bubbles from the cooling fluid. Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hull or the apparatus of Ishimaru modified by Hull as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Flamm US 5,304,282 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Flamm US 5,304,282 in view of Ishimaru, US 5,681,418.

Flamm disclose a plasma source assembly comprising: an outer shield 20; a dielectric chamber wall 26; a helical coil 22 provided between the outer shield and the dielectric chamber wall; wherein the dielectric chamber wall and the outer shield define a resonator cavity; wherein the helical coil is provided within the resonator cavity. It is inherent that the coil is supported and secured within the resonator cavity by coil support and coil secure means, alternatively, Ishimaru discloses an inductive plasma apparatus comprising a coil 40 and coil supporting/securing means 41 (see, for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Flamm as to further comprise coil supporting/securing means, as taught by Ishimaru, since such structure is known and used in the art to support and secure a coil.

Claims 2-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flamm US 5,304,282 or Flamm US 5,304,282 in view of Ishimaru, US 5,681,418.

Flamm and Ishimaru are applied as above but do not expressly disclose that the shield comprises a plurality of plates, however, there is not evidence that the choice of a particular configuration of the shield would significantly affect the overall performance of the plasma processing apparatus.

With respect to claim 3, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Regarding claim 5, Ishimaru discloses a coil formed of conductive pipe capable of flowing cooling water therethrough (see, for example, col. 5, lines 13-16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Flamm as to comprise a coil capable of flowing cooling water therethrough in order to provide temperature control of the plasma source. Note that the apparatus the apparatus of Flamm modified by Ishimaru will comprise means for circulating cooling fluid throughout the resonator cavity.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flamm US 5,304,282 or Flamm US 5,304,282 in view of Ishimaru, US 5,681,418 as applied to claims 1 and 4 above, and further in view of Hull, US 4,431,901.

Flamm and Ishimaru are applied as above but do not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull discloses an inductive plasma apparatus comprising plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Flamm or the apparatus of Flamm modified by Ishimaru as to further

comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flamm US 5,304,282 in view of Hull, US 4,431,901, or Flamm US 5,304,282 in view of Ishimaru, US 5,681,418 and Hull, US 4,431,901, as applied to claim 6 above, and further in view of Komino, US 5,584,971.

Flamm, Hull and Ishimaru are applied as above but do not expressly disclose means for removing bubbles from the cooling fluid. Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Flamm modified by Hull or the apparatus of Flamm modified by Ishimaru and Hull, as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Claims 1, 4-6 and 8-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hull, US 4,431,901 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hull, US 4,431,901 in view of Ishimaru, US 5,681,418.

Hull disclose a plasma source assembly comprising: an outer shield; a dielectric chamber wall 12; a helical coil 10 provided between the outer shield and the dielectric

chamber wall; wherein the dielectric chamber wall and the outer shield define a resonator cavity; wherein the helical coil is provided within the resonator cavity. It is inherent that the coil is supported and secured within the resonator cavity by coil support and coil secure means, alternatively, Ishimaru discloses an inductive plasma apparatus comprising a coil 40 and coil supporting/securing means 41 (see the whole document). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hull as to further comprise coil supporting/securing means, as taught by Ishimaru, since such structure is known and used in the art to support and secure a coil.

Furthermore, note that the apparatus of Hull further comprises: a) means for circulating cooling fluid throughout the resonator cavity; b) a plenum cooling plate 18/20 defining a manifold configured to supply and receive cooling fluid to the resonator cavity, wherein said cooling plate is configured to supply cooling fluid to a first cooling rod provided within the resonator cavity,provided radially outside the coil and having at least one outlet hole configured to discharge the cooling fluid in a circumferential direction within the resonator cavity, and wherein said cooling plate is configured to receive cooling fluid from a second cooling rod provided within the resonator cavity , provided radially inside the helical coil; and having at least one inlet hole configured to receive the cooling fluid from within the resonator cavity; c) wherein a spacer is provided between the first cooling rod and the second cooling rod.

Additionally, note that the apparatus of Hull modified by Ishimaru will comprise the coil insulators provided between the first cooling rod and the second cooling rod, the coil insulators having holes configured to receive the helical coil.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull, US 4,431,901 or Hull, US 4,431,901 in view of Ishimaru, US 5,681,418.

Hull and Ishimaru are applied as above but do not expressly disclose that the shield comprises a plurality of plates, however, there is not evidence that the choice of a particular configuration of the shield would significantly affect the overall performance of the plasma processing apparatus.

With respect to claim 3, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull, US 4,431,901 or Hull, US 4,431,901 in view of Ishimaru, US 5,681,418 as applied to claims 1, 4-6 and 8-13 above, and further in view of Komino, US 5,584,971.

Hull and Ishimaru are applied as above but do not expressly disclose means for removing bubbles from the cooling fluid. Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of

Hull or the apparatus of Hull modified by Ishimaru as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Boulos et al., US 5,560,844.

Boulos et al. disclose a plasma source assembly comprising: an outer shield comprising a plurality of plates 2/13; a dielectric chamber wall 9; a helical coil 3 provided between the outer shield and the dielectric chamber wall; wherein the dielectric chamber wall and the outer shield define a resonator cavity (the space comprise by conduit 30, the coil and conduit 22/25); wherein the helical coil is provided within the resonator cavity with coil support means, and means for securing the helical coil within the resonator cavity; means for circulating cooling fluid throughout the resonator cavity (see, for example, fig. 1 and its description).

Claims 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844.

Boulos et al. is applied as above. Additionally, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Claims 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844 in view of Hull, US 4,431,901.

Boulos et al. is applied as above but does not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull discloses an inductive plasma apparatus comprising plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example; fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boulos et al. as to further comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Regarding claims 8-13, note that the apparatus of Boulos et al. modified by Hull will comprise a plenum cooling plate configured to supply cooling fluid to a first cooling rod provided within the resonator cavity, the first cooling rod being provided radially outside the helical coil and having at least one outlet hole configured to discharge the cooling fluid in a circumferential direction within the resonator cavity; the plenum cooling plate is configured to receive cooling fluid from a second cooling rod provided within the resonator cavity, the second cooling rod is provided radially inside the helical coil and has at least one inlet hole configured to receive the cooling fluid from within the resonator cavity; a spacer is provided between the first cooling rod and the second cooling rod; and insulators (the insulating material around the coil) abutting the spacer and provided between the first cooling rod and the second cooling rod, wherein the coil insulators have holes configured to receive the helical coil.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844 in view of Hull, US 4,431,901, as applied to claims 6 and 8-13 above, and further in view of Komino, US 5,584,971.

Boulos et al. futher disclose means for removing bubbles from the cooling fluid (note that cooling fluid permeate through dielectric wall 9, also note parallel conduits 34). Additionally, Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hull or the apparatus of Boulos et al. modified by Hull as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Additionally, and with respect to the claimed coil/cavity/plenum arrangement there is not evidence that the choice of a particular coil/cavity/plenum arrangement would significantly affect the overall performance of the plasma processing apparatus.

Claims 1, 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyamoto et al., US 5,680,014 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Miyamoto, US 5,680,014 in view of Ishimaru, US 5,681,418.

Miyamoto disclose a plasma source assembly comprising: an outer shield 21/2; a dielectric chamber wall; a helical coil 1/15 provided between the outer shield and the dielectric chamber wall; wherein the dielectric chamber wall and the outer shield define a resonator cavity; wherein the helical coil is provided within the resonator cavity. It is inherent that the coil is supported and secured within the resonator cavity by coil support and coil secure means, alternatively, Ishimaru discloses an inductive plasma apparatus comprising a coil 40 and coil supporting/securing means 41 (see the whole document). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Miyamoto et al. as to further comprise coil supporting/securing means, as taught by Ishimaru, since such structure is known and used in the art to support and secure a coil.

Furthermore, note that the apparatus of Miyamoto further comprises: a) means for circulating cooling fluid throughout the resonator cavity.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al., US 5,680,014 or Miyamoto et al., US 5,680,014 in view of Ishimaru, US 5,681,418.

Miyamoto and Ishimaru are applied as above but do not expressly disclose that the shield comprises a plurality of plates, however, there is not evidence that the choice of a particular configuration of the shield would significantly affect the overall performance of the plasma processing apparatus.

With respect to claim 3, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

Claims 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al., US 5,680,014 or Miyamoto et al., US 5,680,014 in view of Ishimaru, US 5,681,418, as applied to claims 1 and 4-5 above, and further in view of Hull, US 4,431,901.

Miyamoto et al. and Ishimaru are applied as above but do not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull discloses an inductive plasma apparatus comprising a plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Miyamoto et al. or Miyamoto et al. modified by Ishimaru as to further comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Regarding claims 8-13, note that the apparatus of Miyamoto et al. modified by Hull or the apparatus of Miyamoto et al. modified by Ishimaru and Hull will comprise a plenum cooling plate configured to supply cooling fluid to a first cooling rod provided within the resonator cavity, the first cooling rod being provided radially outside the helical coil and having at least one outlet hole configured to discharge the cooling fluid

in a circumferential direction within the resonator cavity; the plenum cooling plate is configured to receive cooling fluid from a second cooling rod provided within the resonator cavity, the second cooling rod is provided radially inside the helical coil and has at least one inlet hole configured to receive the cooling fluid from within the resonator cavity; a spacer is provided between the first cooling rod and the second cooling rod; and insulators abutting the spacer and provided between the first cooling rod and the second cooling rod, wherein the coil insulators have holes configured to receive the helical coil.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al., US 5,680,014 in view of Hull, US 4,431,901, or Miyamoto et al., US 5,680,014 in view of Ishimaru, US 5,681,418 and Hull, US 4,431,901, as applied to claims 6 and 8-13 above, and further in view of Komino, US 5,584,971.

Miyamoto et al., Hull and Ishimaru are applied as above but do not expressly disclose means for removing bubbles from the cooling fluid. Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Miyamoto et al. modified by Hull or the apparatus of Miyamoto et al. modified by Ishimaru and Hull, as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the

cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luz L. Alejandro
Primary Examiner
Art Unit 1763

September 19, 2005